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Decompression: Policy and regulatory options to manage the gas grid in a decarbonising UK

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Introduction

With a 2050 goal for reaching net-zero greenhouse gas emissions in the UK — and only a very limited role expected for gas-based heating — a major policy and regulatory question arises of what to do with the expansive and privatised UK gas network, which is still seeing capital investment. Following a period of uncertainty over clean heating options in the UK, it is increasingly evident to policymakers that the role of hydrogen, and therefore a gas grid, in the future heating system will be limited.

The issues in play are complex, political and could have significant equity impacts:

- Firstly, as people switch or are switched away from gas, the charges to fund the gas grid will sit across an ever-decreasing number of customers, putting up their bills. Some customers without the ability to switch, such as renters, will be particularly exposed.
- Secondly, based on the current regulatory model and assuming no further capital investment beyond the current price control period ending in 2026, the gas network would be valued from a regulatory perspective at around £4 billion in 2050, even though it may have very few customers. This number will be higher due to further expected capital investment.
- Thirdly, there will be significant costs associated with the physical decommissioning of the grid, to make it safe. There is currently no funding

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earmarked to cover these costs and they therefore represent an additional liability for the UK.

The combination of for-profit private ownership, stranded asset risk and a lack of consideration of decommissioning costs places a significant financial liability onto UK citizens, with risks higher than typical for monopoly regulation. Continuing capital investment into the gas grid exacerbates these risks.

In light of a dearth of public consideration and discussion on the subject, this briefing attempts to make a first step in unpacking some of the issues around gas network contraction and decommissioning, and considers policy and regulatory models which could be used to achieve it while best protecting consumers. The briefing is written in the policy context of an imminent Ofgem gas network price control review process for the period 2026 onwards and an expected Government decision on the future role of hydrogen in 2026.

Running on empty

It is clear, and has been for some time, that at least large parts, and likely the vast majority, of fossil gas distribution infrastructure in the UK (and likely around the world too) needs to be decommissioned[2] if climate change goals are to be met — and this has to happen rapidly.

With over half of the gas demand[3] in the UK used outside of power generation going to households, and with the vast majority of gas meters[4] being associated with households and small businesses, the gas distribution network is fundamentally a heating asset.

All independent studies[5] of a clean future heat mix point towards the need for widespread fabric energy efficiency to reduce total demand and for the electrification of heat demand via heat pumps and heat networks. The widescale conversion of domestic gas grids to hydrogen has been comprehensively debunked as a potential solution. As the author has explained before,[6] producing hydrogen and then specifically burning it for heat would result in very poor environmental, economic and sustainability outcomes, though there may be some niche use-cases.

National-level analysis from the Climate Change Committee (CCC) suggests[7] that any long-term gas distribution grid value is likely to be in areas where hydrogen is used for industrial purposes and where hydrogen backs up heat pumps; with hydrogen being used in just 11% of homes in the central scenario, equating to just 13% of the current

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[2] Decommissioning means to withdraw something from service, but the safety issues associated with gas networks mean gas-grid decommissioning requires physical work beyond simply disconnecting from the gas grid and leaving the infrastructure in the ground. Specifically, 'dead-legs', i.e. pipes which go nowhere but continue to contain pressurised gas, need to be dealt with.

[3] Department of Energy Security and Net Zero, Government of the UK. (2012, 2023). *Digest of UK Energy Statistics (DUKES): natural gas.* https://www.gov.uk/government/statistics/natural-gas-chapter-4-digest-of-united-kingdom-energy-statistics-dukes

[4] Spencer Jones, J. (2023, March 22). Over 31.3 million smart meters in GB. *Smart Energy International.* https://www.smart-energy.com/industry-sectors/smart-meters/over-31-3-million-smart-meters-in-gb/

[5] Rosenow, J. (2022, October). Is heating homes with hydrogen all but a pipe dream? An evidence review. *Joule, Volume 6*, Issue 10. https://doi.org/10.1016/j.joule.2022.08.015

[6] Lowes, R. & Cebon, D. (2022, August 24). 'Wrong side of history' | Wake up to the hype around green hydrogen for heating. *Recharge*. https://www.rechargenews.com/energy-transition/wrong-side-of-history-wake-up-to-the-hype-around-green-hydrogen-for-heating/2-1-1282365

[7] Climate Change Committee. (2020, December). *Sixth Carbon Budget*. https://www.theccc.org.uk/publication/sixth-carbon-budget/

gas grid remaining. It's worth noting that since the report in question was published, the CCC has recognised that the role for hydrogen in heating may be even lower,[8] owing to the fact that much of the hydrogen supply in that scenario was 'blue', i.e. made from fossil gas, an energy source which is increasingly costly and insecure.

The urgency of decommissioning gas distribution networks is actually threefold and goes way beyond climate:

- Firstly, climate change requires a rapid and major intervention in response — shutting down gas grids will speed up the deployment of clean heating technologies and encourage capital into clean energy sectors. Every penny available should be spent on clean energy and demand-side options.
- Secondly, maintenance of gas distribution grids is a major consumer issue. If capital continues to be invested into gas infrastructure, those costs will need to be recovered via bills or tax. UK gas network regulation is based on a 45-year asset depreciation timeline.[9] This current approach means that UK citizens will still be paying for gas network assets installed today — which we broadly don't need — in 2068. With the current price-control period lasting until 2028, that means paying off some assets until 2073, assuming no capital investment beyond 2028.
- Thirdly, Russia's war in Ukraine has highlighted Europe's exposure to the international gas market. Before the war, Germany imported around 95% of its gas with significant reliance on Russia.[10] While the UK currently imports gas from less problematic countries, the UK's level of gas imports might not be far from Germany's import dependency by 2035[11] if it continues on its current path, leading it to be increasingly exposed. This is now an economic issue: the UK Office for Budget Responsibility suggests that without action, gas price volatility could add 13% of GDP to public debt by 2050.[12] A secure and equitable energy system for the UK is an energy-efficient and low-fossil-gas one.

Incoming high pressure from the continent

The long-term value of gas distribution grids therefore seems very limited. As a result, one might presume that the UK government and its energy regulator would have well-developed plans to run down gas grids as part of their decarbonisation and energy security strategy. However, any progress has been very limited. Instead, decision-

[8] Climate Change Committee. (2023, March). *Delivering a reliable decarbonised power system*. https://www.theccc.org.uk/publication/delivering-a-reliable-decarbonised-power-system/

[9] Ofgem. (2021, February). *RIIO-2 Final Determinations – Finance Annex (Revised)*. https://www.ofgem.gov.uk/sites/default/files/docs/2021/02/final_determinations_-_finance_annex_revised_002.pdf

[10] Wettengel, J. (2023, January 10). Germany, EU remain heavily dependent on imported fossil fuels. *Clean Energy Wire*. https://www.cleanenergywire.org/factsheets/germanys-dependence-imported-fossil-fuels

[11] Energy & Climate Intelligence Unit. (2023, May). *Rising Gas Imports and the UK's Balance of Trade*. https://eciu.net/analysis/reports/2023/rising-gas-imports-and-the-uks-balance-of-trade

[12] Office of Budget Responsibility. (2023, July). *Financial risks and sustainability*. https://obr.uk/frs/fiscal-risks-and-sustainability-july-2023/

making seems to be pinned, and therefore delayed, to the UK government's expected 2026 decision on the role of hydrogen in heating. That equates to at least three more years of investment into the gas system, while waiting for a government decision, which could be made earlier and which government has already provided a strong view on. According to the current UK energy minister responsible for heat:[13]

> "Government policy remains that heat pumps will be the main solution for decarbonising heat in UK."

In the UK, regulator Ofgem is still regulating gas networks in a business-as-usual manner, albeit with some potential for a 'reopener'[14] if the government makes a significant intervention on heat policy. The only mentions of decommissioning in the final determinations[15] for the live 2021 to 2028 'RIIO-GD2' (Revenues = Incentives + Innovation + Outputs Gas Distribution 2) price control period relate to the removal of old pipes to be replaced with plastic ones, which can last for perhaps 100 years, potentially leading to even greater sunk costs.

Discussions are further progressed elsewhere, spurred on in part by Russia's military action against Ukraine. Denmark is providing funds[16] for households and building owners to disconnect, following the nationalisation of the distribution grid. In Europe, both Vienna[17] and Amsterdam[18] have goals for rapid fossil gas removal, but thus far little detail is available on how the gas grid itself will be dealt with. In the United States, the Public Utilities Commission of the State of California is considering this issue, albeit indirectly, with plans to limit gas grid investments[19] and enhance support for gas alternatives. So-called 'future of gas dockets' from other Public Utility Commissions (state regulatory bodies) exist for Minnesota,[20] Rhode Island[21] and Massachusetts,[22] to name just a few states.

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[13] @MartinCallanan. Twitter post, 21 July, 2023. https://twitter.com/MartinCallanan/status/1682313811930370049?s=20

[14] Ofgem, 2021.

[15] Ofgem. (2020, December). *RIIO-2 Final Determinations for Transmission and Gas Distribution network companies and the Electricity System Operator*. https://www.ofgem.gov.uk/publications/riio-2-final-determinations-transmission-and-gas-distribution-network-companies-and-electricity-system-operator

[16] Evida. (2023, May). *Statens Afkoblingspulje er åben*. https://evida.dk/frakobling/afkoblingsordning/

[17] Stadt Wien. (n.d.). *Plan für klimafreundliches Heizen*. https://www.wien.gv.at/umwelt-klimaschutz/klimafreundliches-heizen.html

[18] Kiely, J. & Lowes, R. (2022, May). *Reaching Zero Carbon: The Next Decent Homes* [Presentation]. NHMF Maintenance Conference. Savills and the Regulatory Assistance Project.

[19] Public Utilities Commission of the State of California. (2022, December). *Staff Proposal on Gas Distribution Infrastructure Decommissioning Framework in Support of Climate Goals*. https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M500/K158/500158371.PDF

[20] Minnesota Public Utilities Commission. (n.d.). *Dockets Open For Comment*. https://mn.gov/puc/get-involved/public-comments/dockets-open-comment/

[21] State of Rhode Island Public Utilities Commission and Division of Public Utilities and Carriers. (2022, June). *Docket No. 22-01-NG – Investigation Into the Future of the Regulated Gas Distribution Business in Rhode Island in Light of the Act on Climate*. https://ripuc.ri.gov/Docket-22-01-NG

[22] The Commonwealth of Massachusetts Department of Public Utilities. (2020, October). *Investigation by the Department of Public Utilities on its own Motion into the role of gas local distribution companies as the Commonwealth achieves its target 2050 climate goals*. https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/12820821

Depressurising the system

We are told by independent energy experts that 'gas distribution grids need to prepare for a disruptive end to their business model'.[23] In Germany, modelling shows that by 2045, nearly 90% of the existing gas system[24] will no longer be needed. But many of those responsible for their regulation appear disengaged from what is one of the biggest energy policy issues facing all governments with high levels of gas in their heat mixes.

The UK gas grids are currently worth about £20 billion from a regulatory perspective,[25] and with continued capital investment this figure is set to increase. The vast majority of this capital investment is associated with the 'Iron Mains Risk Reduction Programme', which is replacing certain 'at risk' pipes with polyethylene ones. While this is a safety-driven programme, it would be prudent to continually assess if such a major gas investment programme could be scaled back.

In fairness, at the RIIO Gas Distribution 1 price control which began in 2013 and ran to 2021, Ofgem did move to a system of 'front-end loaded'[26] depreciation for gas distribution assets (using a sum of digits approach). What this means is that more capital investment is paid off early compared to flat-rate depreciation as had been used previously, thereby reducing stranding risk.

Nevertheless, assumed regulatory/financial asset lives are still 45 years. The new pipes may last for more than 100 years. Even if all capital investment in the UK gas grid stopped today, the regulatory asset value of the gas grid would be over £3 billion in 2050. If the current 'RIIO Gas Distribution 2' price continues as planned to 2026, there would be £4 billion of asset value in 2050, assuming no further investment beyond 2026.

As the number of buildings connected to the gas grid reduces, the charges per building required to cover the network cost would need to increase. Assuming all buildings have stopped using gas by 2050, if the gas networks still have regulatory value, then there would be no, or very low numbers of, bills from which shareholders could recover their investments.

This situation is not theoretical, the gas networks have already told Competition and Markets Authority (CMA) in their appeal against Ofgem on the current price control period that they should receive a higher assumed cost of finance, explicitly to reflect the risk of stranded assets (see sections 5.851 to 5.890).[27] Giving gas network owners a higher assumed cost of finance to mitigate the risk is one option. If the gas grid assets

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[23] Herrndorff, M., Kraus, A., Müller, S. & Saerbeck, B. (2023, April). *Ein neuer Ordnungsrahmen für Erdgasverteilnetze*. Agora Energiewende. https://www.agora-energiewende.de/veroeffentlichungen/ein-neuer-ordnungsrahmen-fuer-erdgasverteilnetze-1/

[24] Görlach, J. (2023, April). *Gasverteilnetze: Eine geordnete Stilllegung schützt Gaskund: innen und Netzbetreiber*. Agora Energiewende. https://www.agora-energiewende.de/presse/pressemitteilungen/gasverteilnetze-eine-geordnete-stilllegung-schuetzt-gaskundinnen-und-netzbetreiber-1/

[25] This is from a regulatory perspective, there is normally a premium on top of the Regulated Asset Value. See: Ofgem, 2021.

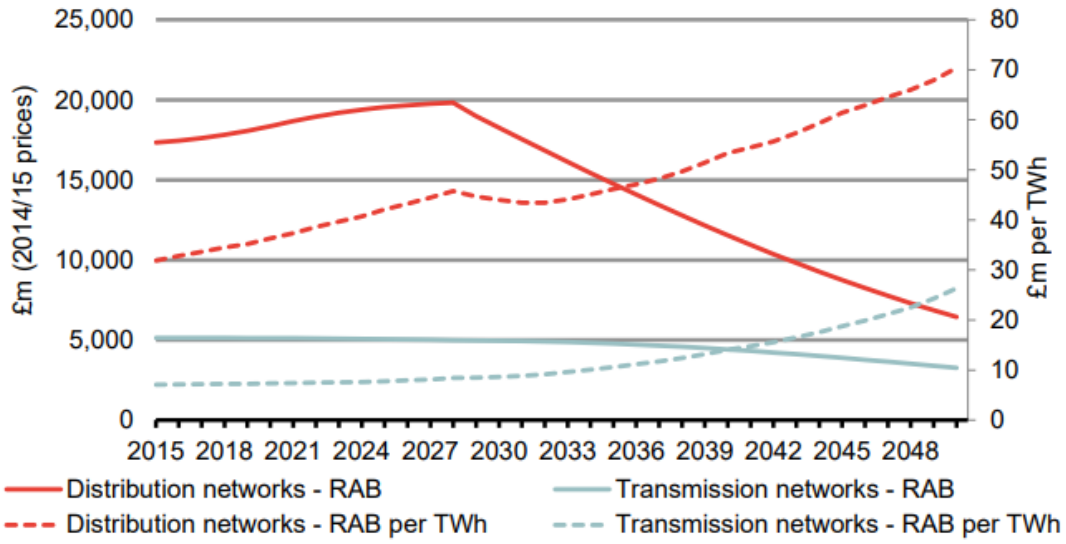
[26] Ofgem. (2011, March). *Decision on strategy for the next transmission and gas distribution price controls - RIIO-T1 and GD1 Financial issues*. https://www.ofgem.gov.uk/sites/default/files/docs/2011/03/t1decisionfinance_0.pdf

[27] Competition and Markets Authority. (2021, October). *Cadent Gas Limited, National Grid Electricity Transmission plc, National Grid Gas plc, Northern Gas Networks Limited, Scottish Hydro Electric Transmission plc, Southern Gas Networks plc and Scotland Gas Networks plc, SP Transmission plc, Wales & West Utilities Limited vs the Gas and Electricity Markets Authority, Final determination, Volume 2A: Joined Grounds: Cost of equity.* https://assets.publishing.service.gov.uk/media/617fe5468fa8f52980d93209/ELMA_Final_Determination_Vol_2A_publication.pdf

were not stranded, however, this allowance would simply result in additional profits for the operators. Regulators would need to carefully balance these considerations. Although the CMA dismissed this issue for the current period, the request raises an important question.

Work for the CCC by Frontier Economics[28] attempted to model the future value and associated bill impact of the gas grid in a decarbonising UK. Figure 1[29] shows that even if investment stops in 2027, in a low-gas scenario (which assumes 20% of gas connections still remain, which is higher than the CCC's balanced pathway), there is still a significant regulatory asset base value in 2050 – a figure increased by the need for some continued investment for operational reasons.

Figure 1. Regulated asset base (RAB) and RAB per TWh profile to 2050 (low gas)



Source: Climate Change Committee. (2016, October). *Future Regulation of the Gas Grid (Frontier Economics)*.

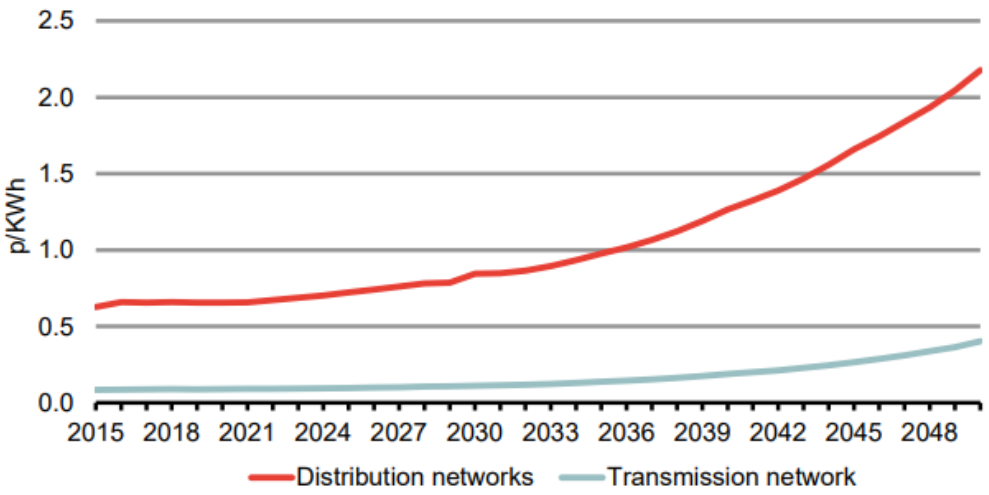
Figure 2[30] from the same analysis shows how as buildings switch away from the gas grid, gas network charges would need to increase significantly — in this example by over three times — to recoup the costs for network owners and fund some (very uncertain) decommissioning costs. If more people switch away, this situation is exacerbated.

[28] Climate Change Committee. (2016, October). *Future Regulation of the Gas Grid (Frontier Economics)*. https://www.theccc.org.uk/publication/future-regulation-of-the-gas-grid/

[29] Climate Change Committee, 2016. Exhibit 29.

[30] Climate Change Committee, 2016. Exhibit 30.

Figure 2. Distribution and transmission tariffs (low gas)



Source: Climate Change Committee. (2016, October). Future Regulation of the Gas Grid (Frontier Economics).

As with all complicated energy policy questions, discussion appears disappointingly limited, no doubt helped by those with interests in keeping the networks (and revenues) going. One model considered by Frontier Economics, among others that are covered later in this brief, is that the gas network regulatory value could potentially be merged with electricity network value to create joint gas and electricity network entities and effectively spread the costs and risks associated with the legacy gas system across electricity consumers.

Such an approach could however have severely negative consequences for electricity users, some of whom have never used gas. This method could also impact negatively on the wider economics of electrification, as it would increase electricity transportation charges and potentially reduce gas transportation charges. This would negatively affect the economics of systemic electrification, the outcome which is being targeted. For a company like National Grid, which has strategically switched away from gas[31] in the UK towards electricity assets, this would likely be a very unwelcome move.

There are also, of course, important safety and equity factors to consider around the future of gas grids – some ongoing investment will be required for safety. Nevertheless, people remove fossil gas heating and switch to alternatives like heat pumps all the time. The gas network wind-down, as part of the wider heat transition, needs to be treated like the project it is and managed appropriately.

Coming back to Denmark, it is one of the few places that has had open cross-industry/academic/regulation/government investigation into the future of gas.[32] This approach has undoubtedly put the country in a better position to make decisions.

[31] National Grid. (2022, March 27). *Sale of majority interest in NGGT and Metering* [Press release]. https://www.nationalgrid.com/gt-announcement

[32] FutureGas. (n.d.). *The FutureGas Project*. https://futuregas.dk

Sniffing out the options

So how should governments and regulators start the process of winding down and decommissioning the gas grid? The first step must be independent analyses of future heat mixes based on the best available data. This could be a function carried out by an energy transformation agency (as argued by the IGov research project for the UK[33]) or could closely involve local authorities, the latter being an approach argued for previously[34] and which is similar to the Dutch approach.

There has been significant national-level modelling on the most cost-effective heat pathways, which has repeatedly indicated the general trend away from gas. However, more local mapping would add legitimacy to plans and be a support for local authorities. Such mapping would provide geographical data on where gas networks need to be decommissioned, where (if anywhere) they may have some potential value for industry and/or hydrogen, and where heat networks should be developed. More integrated planning for the removal of fossil gas[35] could also highlight issues of equity and support integration between gas and electricity system planning. Ofgem is currently considering[36] issues of local governance, and issues around gas grid decommissioning could be considered within this reform.

One oddity in relation to many of our European neighbours is that the UK gas grid is fully owned by private shareholders. Elsewhere, while technically being private, network infrastructure is often owned by municipalities and local authorities. Should gas grid shareholders lose out here? Regulated networks are supposed to be long and smooth equity investments. Conversely, however, most technologies come to an end: these investors and the managers of these networks have known decarbonisation is coming, and no investments should be risk-free.

There are few existing examples of governments needing to actively wind down assets — particularly heavily regulated private ones — in such a short space of time. Some creativity and openness is therefore needed to tackle this challenge.

Three general approaches to gas grid decommissioning have become apparent in discussions over the last decade, although there is little if anything written about such approaches in UK energy policy. Other options may also be available, or indeed combinations of approaches may be optimal. The three broad approaches are briefly expanded below:

1. **Business-as-usual wind-down with accelerated depreciation**: The depreciation rate of network assets is increased so that the regulatory asset value is near zero by 2050, the UK's net-zero target date; very limited investment for critical safety issues is allowed. This could return all, or most, of

[33] Willis, R., Mitchell, C., Hoggett, R., Britton, J. & Poulter, H. (2019, September). *Enabling the transformation of the energy system: Recommendations from IGov.* IGov, University of Exeter. http://projects.exeter.ac.uk/igov/enabling-the-transformation-of-the-energy-system/

[34] Lowes, R. (2019, August 9). *A heat and buildings decarbonisation policy framework for a zero carbon UK* [personal blog]. https://richardlowes.com/2019/08/09/a-heat-and-buildings-decarbonisation-policy-framework-for-a-zero-carbon-uk/

[35] Anderson, M., Rosenow, J. & Cowart, R. (2022, August). *The clash with gas: Should it stay or should it go?* The Regulatory Assistance Project. https://www.raponline.org/knowledge-center/clash-with-gas-should-it-stay-or-should-it-go/

[36] Ofgem. (2023a, March). *Consultation: Future of local energy institutions and governance*. https://www.ofgem.gov.uk/publications/consultation-future-local-energy-institutions-and-governance

the sunk shareholder costs by 2050, but it would push up bills for all gas users and could risk a utility death spiral[37] if bills increase rapidly. The CMA suggested that increasing depreciation speed[38] would not be enough of an incentive to push people away from gas; however, that would depend on the cost of alternatives (which is expected to fall) and the number of people who switch away.

Equity implications could be significant, with people struggling to switch to clean heat alternatives footing this bill. There will also be the actual costs of safely decommissioning the gas grid, and these will need to be funded. A levy could be added to gas distribution charges to raise the funds to cover future decommissioning costs, but again this would further push up bills. Accelerating depreciation currently appears[39] to be Ofgem's favoured approach to managing the risk of stranded assets. Little has been mentioned about decommissioning.

2. **Evolutionary regulation**: Under this model, the gas networks are regulated to evolve into clean heat providers. They could become the parties responsible for delivering district heating in urban areas while simultaneously decommissioning the gas grids; their skills in pipework and roadworks could be well suited to such a challenge. Owing to issues over regulatory capture, however, this would need tight regulation.

   This more collegiate approach could potentially also allow workforce continuity, although with the predicted reduction in capital investment, the general expectation is that the workforce will shrink after 2032. The development of 'clean heat standards'[40] in the United States may showcase an interesting model, in particular in Vermont where the Affordable Heat Act is expected to result in an obligation on the (integrated) gas utility and fossil fuel suppliers, but it is not directly transferrable.

   Such a model may make most sense where municipalities or local authorities own multiple infrastructures and can jointly plan. It does not appear to be well suited to the UK's fully private and unbundled environment. There is also a question in this model over why future district heating users should be saddled with gas network legacy debts if such a model was taken forwards. To manage the equity issues around the assignment of such legacy risks, in such a model there might still be a need for public underwriting of liabilities for both stranded assets and decommissioning costs.

3. **Nationalisation and planned wind-down.** With such a rapid winding down required, which also needs to be coordinated with the wider energy transition including a growing power system and expanding heat networks, a more interventionist approach may be required whereby gas networks are renationalised and wound down as part of a government-run and controlled

[37] Lacey, S. (2014, March 4). This Is What the Utility Death Spiral Looks Like. *Greentech Media*. https://www.greentechmedia.com/articles/read/this-is-what-the-utility-death-spiral-looks-like

[38] Competition and Markets Authority, 2021.

[39] Competition and Markets Authority, 2021.

[40] Santini, M., Cowart, R., Thomas, S., Gibb, D., Lowes, R. & Rosenow, J. (2023, March). *Clean heat standards: New tools for the fossil fuel phaseout in Europe*. The Regulatory Assistance Project. https://www.raponline.org/knowledge-center/clean-heat-standards-new-tools-for-fossil-fuel-phaseout-in-europe/

programme. Nationalisation was previously used to convert the networks to natural gas from town gas and coordinate their expansion.[41]

In Denmark, in 2016, the government took a decision to consolidate and take over ownership of all gas distribution grids, a process which concluded in 2021.[42] Denmark is aiming for all homes currently served by the gas grid, around 400,000, to switch to district heating or heat pumps by 2030.[43] Notably, the Danish gas grid is significantly smaller than the UK one, providing gas to around 15% of homes[44] rather than the UK's 85%. The Danish government provides funding[45] to households to cover the gas network disconnection costs.

Such an approach could remove the profit motive from gas network operators, which could be a particular issue if networks are being actively run down. This approach would also allow heat decarbonisation to be treated more as a national project, but it would move all risk faced by shareholders onto UK taxpayers.

Stemming the flow

While one can understand the political merit of options 1 and 2 above, in light of the size and speed of the challenge there is a risk they could be too slow and incremental when a more active approach is needed. Without significant intervention, these approaches could also give too much leeway to the current fully privately owned gas networks which have already shown themselves to be unable to act in the best interest of current and future consumers, promoting false energy solutions, and funding campaigns against real solutions[46] via trade associations.

Issues of equity could also be a concern if costs are poorly managed and a small number of customers, without the means to switch, end up paying concentrated network charges. Concern over the current financial management and regulation of UK water utilities[47] also highlights issues around profit maximisation and underdelivery even at times of relatively normal operations. During such a complex time, there is a significant regulatory gaming risk associated with information asymmetries between regulator and licensee (i.e. network operator) and Government and regulator should prioritise consumer protection above all else.

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[41] Arapostathis, S., Pearson, P.J.G. & Foxon, T. (2014, June). UK natural gas system integration in the making, 1960–2010: Complexity, transitional uncertainties and uncertain transitions. *Environmental Innovation and Societal Transitions, Volume 11*. https://doi.org/10.1016/j.eist.2014.01.004

[42] Evida. (n.d. (a)). *Historien bag Evida: Fra tre selskaber til ét*. https://evida.dk/om-evida/historien-bag-evida/

[43] The Local.dk. (2022, April 19). Denmark announces major plan to replace gas heating in homes. *The Local*. https://www.thelocal.dk/20220419/denmark-announces-major-plan-to-replace-gas-heating-in-homes

[44] Kerr, N. & Winskel, M. (2021, February). *A review of heat decarbonisation policies in Europe*. Climate Xchange. https://www.climatexchange.org.uk/media/4625/cxc-a-review-of-heat-decarbonisation-policies-in-europe-feb-2021.pdf

[45] Evida. (n.d. (b)). *Sådan opsiger du din gasforsyning*. https://evida.dk/frakobling/opsigelse-mit-evida/

[46] Cooke, P. (2023, July 20). Revealed: Media Blitz Against Heat Pumps Funded by Gas Lobby Group. *DeSmog*. https://www.desmog.com/2023/07/20/revealed-media-blitz-against-heat-pumps-funded-by-gas-lobby-group/

[47] Ofwat. (2023, June). *Statement on financial resilience in the water sector*. https://www.ofwat.gov.uk/statement-on-financial-resilience-in-the-water-sector/

For the UK, nationalisation of gas distribution infrastructure could remove the profit motive from owners to maximise investment and returns (as the current model does), and would allow the government and regulator to properly plan and deliver gas system wind-down in coordination with other parties such as electricity distribution system operators and local authorities. Allocation of costs and benefits would also be easier to manage.

The nationalisation option does also come with downsides: the government could end up shouldering all of the risk, financial and political, and tight management of the networks would be required. On the other hand, seeing that the gas networks have been profitable businesses for many years, and have historically been exceptionally so,[48] nationalisation could allow for the recovery of any excess profits to the public purse while allowing for a more equitable allocation of stranding and decommissioning costs over the longer term. This approach would not be nationalisation for political reasons, but would be nationalisation to support a specific project end goal.

For such a major infrastructure transition, which would require coordination across industries, local authority involvement and clear communication with citizens, there does appear to be a strong need for significant state involvement to manage financial interests and wind down and decommission the gas grid, whether or not renationalisation is involved. While rapid change could potentially be achieved by reformed regulation, unless the current asset value-based model can be totally reconfigured, there is a significant risk of failure and/or major equity impacts.

Besides the fact that the investments would need to be paid off before 2050, reformed regulation would also need to deliver an equitable funding model for decommissioning costs. Perhaps increasing gas distribution charges to cover these costs and liabilities would work with the current model and could support efforts to rebalance bills to support electrification; but it may just be simpler to take the network back into public hands, allowing the government to act more nimbly and pragmatically particularly when concerns over equity and death spirals are considered.

The fundamental issue here is how government should most equitably allocate the costs and risks associated with stranded gas infrastructure as well as decommissioning costs. There is also significant uncertainty over what decommissioning costs will be — an issue which, as Frontier Economics pointed out in 2016,[49] is clearly worthy of significant further research. Stranding costs are easier to understand and plan for, but without knowing what decommissioning practically involves, and what costs are, it is difficult to plan for. Nevertheless, decommissioning does represent a significant liability which appears to sit with the UK taxpayer.

Implications for government

The next UK gas distribution price control review is expected to start in April 2026. However, because of uncertainty on heating, Ofgem had suggested that the current price control could be rolled over for two additional years until 2028. The UK

[48] Wild, M. (2017, July). *Energy Consumers' Missing Billions.* Citizens Advice. https://www.citizensadvice.org.uk/about-us/our-work/policy/policy-research-topics/energy-policy-research-and-consultation-responses/energy-policy-research/energy-consumers-missing-billions/

[49] Climate Change Committee, 2016.

government is planning to make a decision[50] on the future of the gas grid and the role of hydrogen in 2026, and a delay would give Ofgem time to react. In Ofgem's own words:

'This discussion of the GT and GD example models has not considered what is perhaps the most pressing regulatory question for the sector today, which is one of timetable. There are two large-scale uncertainties hanging over the sector: what scale and type of hydrogen conversion should we plan for; and what heating decarbonisation solutions are envisaged on what timetable? These have such a fundamental impact on the future of gas networks that there is an argument for delaying a completely new price control until these uncertainties are resolved to a greater extent. This could suggest a role for a simplified short-term price control.' [51]

Ofgem has since suggested[52] that it is now minded to return to the previous timescale and start a new 'medium term ex-ante framework' (aka business as usual) in 2026. Ofgem suggests that in that upcoming price control review, long-term risks associated with the use of the gas grid could be managed through depreciation rates/asset lives with the potential for 're-openers' which give the option to modify the price control if a major event occurs. Both options protect the gas network owners but offer limited upside for consumers. Ofgem suggests that this updated timeline is lower risk than a shorter two-year review in advance of 2028.

But clearly there are risks. Every second of delay leads to an increase in potential stranded assets and increases the financial exposure of UK citizens, not just to gas network costs, but to energy insecurity and climate change costs. Undoubtedly, decommissioning gas infrastructure is an energy policy challenge — but it is also an inevitability which will drive significant upsides in the long run. Overall we make these recommendations to the UK government:

1. Take steps to gain a thorough understanding of the required process and costs of decommissioning the gas grid in order for this risk to be properly considered.
2. Ofgem and the UK Department for Energy Security and Net Zero should work together with other parties to develop a plan which equitably allocates the multi-billion-pound risks associated with stranded gas assets and decommissioning, considering the value of accelerated depreciation, evolutionary regulation and renationalisation.

[50] Department of Business, Energy & Industrial Strategy and Department of Energy Security & Net Zero, Government of the UK. (2023, June). *Energy Security Bill factsheet: Enabling the Hydrogen Village trial*. https://www.gov.uk/government/publications/energy-security-bill-factsheets/energy-security-bill-factsheet-enabling-the-hydrogen-village-trial

[51] Ofgem. (2023b, March). *Consultation on frameworks for future systems and network regulation: enabling an energy system for the future*. https://www.ofgem.gov.uk/publications/consultation-frameworks-future-systems-and-network-regulation-enabling-energy-system-future

[52] Ofgem. (2023, July). *Open Letter Decision on the Future of Gas Price Controls*. https://www.ofgem.gov.uk/publications/open-letter-decision-future-gas-price-controls?

3. Consider whether the Iron Mains Risk Reduction Programme continues to offer consumers value for money as a major capital investment programme — and if not, intervene as soon as is practicable.
4. Ensure that approaches to heat and local area energy planning, and wider clean heating policy, are coordinated with the issue of gas grid decommissioning and that consumer protection is central.

The conversation around the future of the gas grid has been going on for some years with little action, but two key opportunities now present themselves: the government's 2026 decision on the role of hydrogen for heating, and the upcoming Ofgem price control review. Multiple approaches to managing the decline of the UK gas grid are possible, but the sooner action is taken, the less consumer money will be at risk and the more rapid climate and energy security progress will be.

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